THE INTRICATE RELATIONSHIP BETWEEN GOODS MOVEMENT

AND

TRANSPORTATION IN CALIFORNIA

National Freight Transportation Workshop

By
Dilara Rodriguez
California Department of Transportation

Minneapolis - St. Paul, MN
September 12, 2000

In California the issue of movement of freight on a national and international levels is an extremely important subject to both the goods movement industry members, as well as the policy makers. With the implementation of the NAFTA treaty, the close relationship between goods movement, and the national economy has been intensified. It highlighted the role of transportation system as an integral tool to strengthen our leadership role in the global economy, whether as a state and/or as a nation.

This paper will attempt to highlight some of the goods movement initiatives, goasls and policies, within the State of California and amongst our local and regional partners.

BACKGROUND

Economic Setting

California is an economic powerhouse, fueled by the production and movement of goods and services. California's ports, airports and related businesses contribute over $40 billion per year to the national economic output, over one million jobs, over $20 billion in annual personal income, and over $8 billion per year to federal taxes and customs duties. In manufacturing alone, approximately two million people are employed with a payroll of about $65 billion per year.

The efficient movement of goods is essential to the prosperity of California. California's freight transportation system is the lifeline of the state's domestic and international trade, moving almost $640 billion of California's commodities in 1993. This is $180 billion more

than the next highest state in terms of commodity shipments. Over 800 million tons of freight is moved out of, into and within the state every year.

International trade is an important component of California's vibrant economy. International trade amounts to some $260 billion. In 1994, there were over $40 billion in exports to Asia, with Japan, South Korea, and China being the top three export destinations. California's other top export countries are Canada and Mexico. In 1994, California had $16 billion in trade with Canada, and $13.5 billion with Mexico. Other major trading partners includes the United Kingdom and Germany. In 1993, more than 60 percent of all of goods produced in California moved to other destinations within the state, worth over $390 billion.

Statewide Transportation System

The state's mature transportation system of roads, rails, airports and ports serves a diverse range of needs for the movement of goods. The goods movement transportation system provides for the movement of local, regional, interregional, interstate and international commerce on an integrated, multimodal network. This system supports the economy by delivering raw materials, intermediate goods, and finished products to production, consumption, and disposition points. This excellent transportation system and California's robust economy are intricately linked.

THE STATEWIDE GOODS MOVEMENT STRATEGY

This is a strategic policy and action blueprint for improving the goods movement transportation system. This strategy, approved by the Governor in August 1998, focuses on improving existing system efficiency, through new technology and other means, to maximize system capacity and reliability, and minimize long-term transportation system costs. It serves as one element, together with the Transportation System Performance

Measures report, of the 1998 California Transportation Plan implementation update. It has been prepared to ensure that the quality of life in California is maintained and improved in the future.

This strategy is based on a vision and commitment to the goods movement transportation system. The vision is that the State's transportation system is a balanced, integrated, multimodal network. Swift economic movement of goods through our airports and seaports throughout the State gives California businesses a competitive edge by adding value to their products and services. The commitment is that Caltrans fosters the development of an integrated, multimodal, goods movement transportation system that is safe, efficient and effective. It recognizes that this statewide system of highways, rail lines, pipelines, air cargo facilities, seaports, and space launch and recovery facilities is essential to a healthy economy and quality of life in California.

Goals & Objectives

California is expected to grow and prosper in the future, if the transportation system can keep up with forecast demands. In the 20-year period from 1992 to 2012, California's population is expected to increase by 40 percent, to almost 44 million people. Consumption of goods will grow by as much as 50 percent and production will expand at almost the same rate. The volume of goods moved is expected to increase by 46 percent. This demands that direct action be taken by the State to maintain and improve the State's goods movement transportation system.

The goals and objectives of the strategy set the direction for the specific long-term improvement of the goods movement transportation system.

Goal 1:

Enhance California's economic vitality by improving multimodal access and mobility for goods.

Objectives:

1. Reduce non-recurrent delay due to accidents and other incidents.

2. Reduce recurrent delay on the transportation system.

3. Reduce the number of transportation system miles requiring immediate rehabilitation.

4. Reduce delays at California State and international borders.

5. Improve intermodal access and connections between airports, seaports, border crossings, and rail, truck and intermodal terminals.

6. Reduce physical, operating and regulatory impediments.

Goal 2:

Develop and manage the transportation system based on explicit understanding of system performance and customer expectations.

Objectives:

1. Develop improved analysis tools and information to support evaluation of the goods movement transportation system's performance, improvement alternatives, and community and other significant impacts.

2. Expand and strengthen partnerships between the goods movement industry and the public sector.

Strategic policies

Ten strategic policies are outlined to direct the State's response to the maintenance and improvement of this system. They are based on the CTP Guiding Principles. The strategic policies are:

1. The State's multimodal goods movement transportation system shall be maintained and improved.

2. Goods movement must be given full and appropriate consideration in the planning, design, development, operation, maintenance, and funding of the State's transportation system at the State, regional and local level.

3. The State shall participate, to the extent allowed by law, in the planning, developing, and funding of each modal component of the transportation system, including highways, rail lines, airports, seaports, pipelines, space launch and recovery facilities, intermodal terminals and border crossings.

4. The State must have the financial and technical flexibility, to the extent allowed by law, to respond to transportation problems that are in the public interest, regardless of facility or mode.

5. The State shall take a long-term approach in planning and investing in California's transportation system for the next generation.

6. Statewide system investments should initially be focused on those interregional corridors and facilities that carry and handle the primary share of goods movement today and into the near term.

7. The State recognizes that the feeder access network of highways, roads, branch and short-line rail lines, and smaller seaports and airports must also be maintained as fundamental components of the State's transportation system.

8. The State shall maximize transportation system performance and system preservation by pursuing cost-effective new technology approaches and operational strategies.

9. The State's goods movement improvement efforts shall be customer based, customer focused, and customer responsive.

10. The State shall work in close partnership with all levels of government and the private sector, and seek integrated, consensus solutions to transportation issues that enhance public safety, environmental resources, and quality of life.

Actions

The actions identified in the Goods Movement Strategy should improve the state's transportation system in a variety of ways. The number of traffic bottlenecks will be reduced, safety will be improved, congestion will be reduced, cooperation and coordination will be increased, and better information will be provided to customers and decision-makers. The goods movement strategy will employ and mainstream new technology improvements into the transportation system wherever appropriate.

A series of action alternatives was identified for possible implementation through the strategy to address goods movement's transportation system issues. The 64 actions identified address the strategy's seven issue categories: Capacity Constraints/ Network Limitations; Design Restrictions; Operational Issues; Safety and Maintenance; New Technology Development and Implementation; Funding, Programming, and Planning Constraints; and Policy, Regulatory and Institutional Restrictions.

The inventory of actions was subject to an evaluation to select those that would be recommended for implementation as part of this strategy. A sketch-level benefit/cost analysis approach was used. Three evaluation categories, covering 27 different evaluation criteria, were used to analyze the actions. A final sensitivity analysis test was used, in conjunction with professional judgment, to finalize the recommended action list. The 42 recommended actions are the high priority measures that the State, regional, local and private partners should undertake now and over the next five years to improve the goods movement transportation system. For each action, an agency or governmental level that is responsible for or has the lead in implementing an action is identified. This responsibility identification should be interpreted broadly, however. Most actions will require involvement from a number of stakeholders at the federal, State, and local level. In most cases, private sector involvement will be mandatory to make sure the most appropriate responses are planned, designed and implemented.

The implementation time frame listed is also quite broad. Actions are described as either short term (i.e., to be completed in the next five years) or long term.

Statewide Intermodal Goods Movement Advisory Committee

To facilitate the public / private participation effort for this strategic plan, a Caltrans Statewide Intermodal Goods Movement Advisory Committee was created. It acted as the project technical committee. It assisted Caltrans project staff in the identification and analysis of problems and issues; action alternatives, evaluation factors, responsible parties and roles; and strategy recommendations. Membership on the SIGMAC ranged from local, county, regional state, and federal public sector representatives, from the transportation industry to the environmental groups, to members of the private sector stakeholders. Private sector representatives from the various freight modes of transportation were present, from both northern and southern California, the rail to the trucking industries as well as the ports and the airports. Teaching and research institutes, and private sector consulting firms lending their own technical expertise in this effort had a seat at the table too. The SIGMAC experience was a true demonstration of the collaboration amongst the private and public sector interested parties, decision-makers and staff, working together to meet set goals. This committee or one very similar to it in definition is to be reconvened by the state to assist in the continuation and implementation of the actions adopted, part of the 1998 Statewide Goods Movement Strategy. Apart from this statewide effort, there are 9 freight advisory councils in the state and Caltrans is an active member of each. For example in Southern California the MPO has created a Goods Movement Advisory Committee (GMAC) with a diverse public and private membership. Membership includes the Regional Council, local governments, and members of the goods movement industry such as the ports of Los Angeles and Long Beach, Alameda Corridor Construction Authority, Alameda Corridor East,

California Trucking Industry, the Burlington Northern & Santa Fe rail company, and others, with Caltrans being an active member.

Much has been done to get a better handle on the economic importance of goods movement to the state's economy, and its conveyance to State, regional and local decision-makers, Caltrans districts, regional transportation agencies, and the general public. However, to more adequately respond to goods movement issues, greater planning research and education must be accomplished, if goods movement trends and issues are to be identified and understood, and goods movement programs, actions and projects are to be identified, programmed, implemented, and evaluated.

Lessons learnt from the private public participation process was that the earlier the industry was invited to participate, have a seat at the table, and provide input the better the coordination level and the final outcome. The private industry does definitely move on a faster pace than the public sector, in general. To keep a keen level of interest by the private sector, we need to approach our meetings and procedures at a higher momentum.

PERFORMANCE MEASURES

The previous federal transportation bill ISTEA, and the Clean Air Act Amendment called for the development of performance based measures to help decision makers better analyze transportation options and select trade-off. The main goal was to develop specific, easy to understand and to quantify performance indicators to better inform of the funding and investment choices available for transportation.

The Performance Measurement Initiative currently led by the California Department of Transportation (Caltrans), addresses research regarding the applicability of performance indicators to the goods movement market.

- The main finding: it is feasible for the State and regional partners to apply performance measures in a manner that encompasses freight.

- The most applicable outcomes are: safety / security; reliability; mobility / accessibility; equity; economic well-being; and environmental quality

- Indicators identified for the highway and transit modes, in some cases with minor modifications, can address truck and freight rail activity. With some indicators, data limitations will not allow a comprehensive analysis of the freight markets separately (e.g., delay for rural areas)

- Some of the indicators can be used only for monitoring, some only for forecasting, and some for both.

Initially four outcomes were selected as being the most applicable to the goods movement market: reliability, mobility and accessibility, safety, and equity. Subsequent interviewees confirmed the adequacy of this selection, and brought up potential benefits in tracking other outcomes, such as economic well-being and environmental quality. Other individuals expressed the opinion that all outcomes listed in the performance measure framework can be tied to goods movement at some level.

The following table summarizes findings, conclusions and recommendations for each outcome area.

SUMMARY FINDINGS

OUTCOME	INDICATOR	FINDINGS	CONCLUSIONS	IMPLEMENTATION RECOMMENDATIONS
Safety / Security	Safety Rates	• Safety rates are mandated and reported by freight rail carriers • Safety rates for trucks are collected by the California Highway Patrol	Use safety rates as indicator for the safety and security outcome	• Use consistent units for safety rates • Develop baseline safety for regions/State to monitor and report safety for improvements

Reliability	Standard Deviation of Travel Time	• Reliability of travel time can be calculated for non-recurrent delay for both truck and rail • Reliability for trucks will be the same as the reliability measured for the highway	Use the standard deviation of travel time variability in excess of the mean (highway and truck) and in excess of scheduled travel time (bus) as indicator for reliability	• Develop baseline reliability for regions/State to monitor and report reliability for improvements
Mobility / Accessibility	Travel Time	• Travel time can be derived from highway inductive loops and freight railroad data	Use travel time as the first indicator for freight mobility	• Use loop data as basis for determining travel time (highway/truck) • Use freight railroad data as basis for determining travel time for rail • Develop a baseline travel time for regions/State to monitor, forecast and report travel time for improvements
	Delay (Lost Time)	• Delay (lost time or recurrent delay) can be calculated based on the difference between actual and optimal travel times • Optimal travel times are based on free-flow (i.e., uncongested speeds) for both truck and rail	Use delay as the second indicator for freight mobility	• Define delay as the difference between actual and optimal travel time calculations to determine delay for truck and rail • Develop a baseline delay for regions/State to monitor, forecast and report delay for improvements
	Accessibility to Intermodal Facilities	• Access to intermodal facilities is limited due to parking restrictions and hours of operation	Use accessibility to intermodal facilities as indicator for freight accessibility	• Refine facilities to include in accessibility (e.g., ports) • Work with regions and facilities to develop consistent GIS interface • Develop baseline accessibility for regions/State to monitor, forecast and report accessibility for improvements
Equity	Regional Share of Mobility Benefits	• The urban/rural split of project improvements dedicated to goods movement is the biggest equity concern	Use the project cost breakdown for the regional share of mobility benefits as indicator for equity in	• Track project costs for freight improvement projects • Develop a consistent definition of urban and

		• Breakdown of urban/rural cost components for projects can be achieved	freight improvement projects	rural areas • Calculate the equity indicator for freight based on the share of the investment benefitting urban and rural sections • Develop baseline equity for regions/State to monitor, forecast and report equity for improvements
Economic Well-Being	Final Demand	• There are three primary ways to define and apply the final demand indicator • The indicator is best used for forecasting	Use final demand for freight industry services as the indicator for goods movement economic well-being	• Apply the indicator to goods movement by measuring final demand in freight-related transportation industries • Continue to examine the applicability of the REMI regional economic model as analysis tool • Develop baseline economic well-being for regions/State to forecast and report on indicator
Environ-mental Quality	Environmental Indicators	• Both the State through the Air Resources Board and the Federal Government (through the Environmental Protection Agency) require project reporting	Use the environmental indicators already mandated for State and federal regulations	• Use mandated environmental indicators • Develop baseline environmental quality for regions/State to monitor, forecast and report for improvements

APPROACH

The approach that led to the final selection of the best performance measures to meet the state needs was driven by the following elements:

- The evaluation was to focus on the most relevant outcomes in the performance measurement framework.

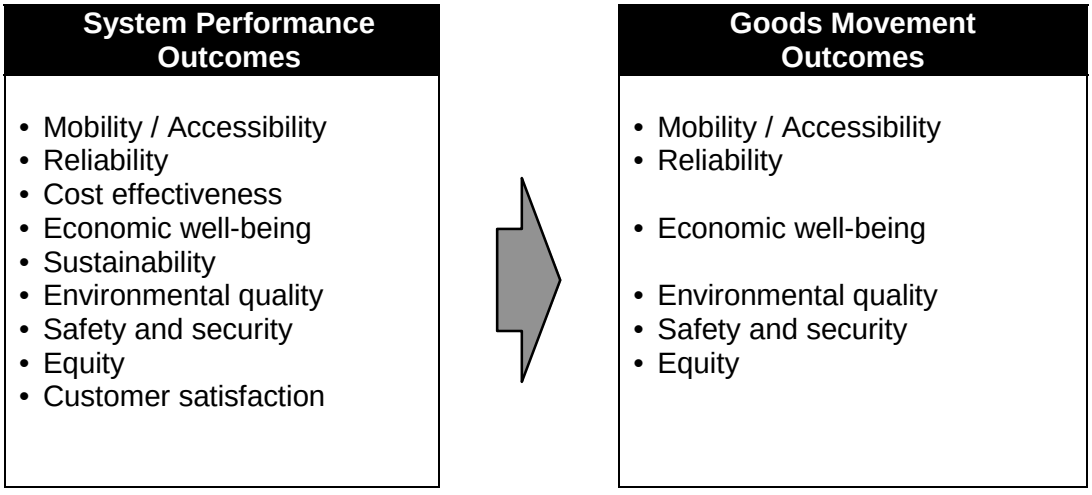
- The evaluation needed to address how the State and regions can apply performance measures in a manner that encompasses freight, both from a monitoring and forecasting point of view.

- The goods movement markets considered in the analysis include the highway (i.e., truck trailer and less-than-truckload traffic) and railroads (i.e., short-line and Class I railroads) in California.

- Discussions included input from the team, which developed the freight module of the California Transportation Plan (CTP), from the System Measures Working Group (SMWG), and from the consultant team freight professionals.

However, the SMWG agreed that the proper way to proceed with regards to goods movement is to select a subset of the most appropriate outcomes, develop corresponding measures, and then implement for monitoring and forecasting, as appropriate.

The exhibit below shows the six areas of outcomes that were considered most applicable to goods movement, from the overall nine base system outcomes listed.



Other Local Efforts In The State

ISTEA required states and Metropolitan Transportation Organizations (MPOs) for non-attainment regions to develop and implement Congestion Management Systems to include methods to measure and monitor performance. MPOs were granted flexibility to revise the federal list of possible performance indicators to meet their local needs.

1. Southern California Region

In California, the Southern California Association of Governments (SCAG) through the 1994 Regional Mobility Element set the stage for the abandonment of the old Level of Service measure, and to approach the performance concept from the users of the transportation system. This is in contrast to the traditional facilities and vehicles approach. The performance indicators have proven to be extremely useful for the SCAG region and subregions, by assisting their decision-makers better understand the pros and cons of their transportation investment. This approach, to transportation planning focuses on the understanding of how transportation systems affect society. Does it foster economic development? Does it impact the environment? Does it generally improve the quality of life?

The criteria for the selection of the performance indicators ranged from: whether they were multimodal; comparable across time and geographic areas; easily understood; reflect the broad array of impacts of transportation choices; relate to the 16 ISTEA MPO Planning Factors - namely mobility, access for people and goods, and system performance and preservation; and if they are based on available data.

Seven performance indicators were selected for the SCAG region and they are: mobility, accessibility, environment, cost effectiveness, reliability, safety, and equity. Currently, there is an ongoing effort through the Goods Movement Advisory Committee (GMAC) to focus on the definition of freight projects and the related freight factors. The goal is to assist in the selection and funding of transportation related goods movement projects in the region through the next Regional Transportation Plan update for 2001.

2. Northern California Region

In Northern California the Metropolitan Transportation Commission (MTC) as the MPO developed a set of criteria to evaluate projects. It is a scoring process used to develop the region's STP and CMAQ program under ISTEA and TEA-21. The criteria were used to select projects for inclusion in the TIP. The following contextual information will assist in better understanding the selected criteria:

- The criteria in the "1995 Multi-modal project Application" are quite similar to the criteria used throughout ISTEA. At the time, system rehabilitation, safety, congestion relief, and expansion all competed for funding from the same single pot of Federal Funds.
- The criteria "25% Category Funds" were used to program 25% of the region's total STP and CMAQ funding in the first three years of TEA-21 (FY 97/98 - FY 99/00). This 25% portion was directed toward "system management projects" and was programmed through a regionally competitive process. The remaining 75% portion was directed to system rehabilitation projects, for which there was another set of

program guidelines and evaluation criteria. Those criteria did not give special priority to freight-related projects.

- Last fall MTC followed a different model for programming the last three years of STP and CMAQ under TEA-21 (FY 00/01 - FY 02/03). There was no regionally competitive process and therefore no scoring criteria. However the same general eligibility criteria applied tot he system management program element.

Freight Facilities Factor

Another important effort that was supported by all policy makers in the State was initiated during ISTEA re-authorization by the southern California MPO, SCAG. It was a proposal to fund goods movement out of the next transportation bill (TEA-21). The proposal was a Freight Facilities Factor, which introduced a funding formula based on each states rail and lane miles, and the value and volume of goods moved. This was a first time effort to fund goods movement through a formula based process. The result was the direction given to BTS to look into a national database for goods movement, by state by mode and so forth. Once a national uniform reporting system for goods movement related data is in place, funding of goods movement transportation projects equitably amongst the states will become achievable. In the meantime we need to concentrate our efforts at closing the data gaps and outlining the importance goods movement is to the national economy, and the role of transportation, by whichever mode, plays.

In closing I would like to emphasize the importance of performance measures as an implementation tool for the adopted goods movement strategies. The goals and performance measures recommended by the Statewide Goods Movement Strategy will

serve as a measuring tool to gauge the anticipated success. In addition the State has acknowledged the importance of, and vital role for the freight customers, whether in the planning and/or the implementation stages.

Caltrans does understand the importance of the performance measures to insure the sound investment in goods movement related programs, and that California's transportation system needs to be considered safe, efficient, as well as a globally competitive economic tool.